

CLAIMS

1. A wide bandwidth Raman amplifier including a laser pump source of pump radiation, and means for producing from the pump source a plurality of wavelengths of pump radiation including means for independent power control of each radiation wavelength.
2. An amplifier according to claim 1 including only one pump source.
3. An amplifier according to claim 1 wherein the means for producing the plurality of pump radiation wavelengths includes one or more reflectors.
4. An amplifier according to claim 3 wherein each reflector produces optical feedback to the pump source at one wavelength and the characteristics of the reflectors are selected such that each reflector produces optical feedback at a different wavelength to the wavelengths produced by the other reflectors.
5. An amplifier according to claim 1 wherein the means of power control of each pump radiation wavelength includes one or more variable optical attenuators.
6. An amplifier according to claim 5 wherein there is a

separate variable attenuator for each reflector.

7. An amplifier according to claim 1 wherein at least some pump radiation of more than one wavelength is coupled to the signal to be amplified.

8. An amplifier according to claim 5 including control means for controlling and/or adjusting the attenuation of each variable optical attenuator(s).

9. An amplifier according to of claim 1 wherein the means for providing adjustable optical feedback includes one or more optical switches providing either substantially no attenuation or substantially 100% attenuation depending on the setting of the switch.

10. An amplifier according to claim 9 including control means for selectively controlling the switches in order to change the overall characteristics of the amplifier.

11. A method of providing a wide bandwidth Raman amplifier including the step of producing from a pump laser source, a plurality of wavelengths of pump radiation by providing adjustable optical feedback to the laser source at these wavelengths.

12. A method of providing a wide bandwidth Raman

amplifier including means for altering the amplifier gain profile during amplifier operation.

13. A wide bandwidth Raman amplifier including only one laser pump source of pump radiation, and means for producing from the pump source a plurality of wavelengths of pump radiation including means for independent power control of each radiation wavelength and including

one or more reflectors

wherein each reflector produces optical feedback to the pump source at one wavelength and the characteristics of the reflectors are selected such that each reflector produces optical feedback at a different wavelength to the wavelengths produced by the other reflectors.

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